

TEWAUKON - CLOUDS LAKE - LAKE ELSIE - STORM LAKE
and WILD RICE REFUGES NARRATIVE REPORTS
1939 to 1956

FROM
SAND LAKE NATIONAL WILDLIFE REFUGE
NARRATIVE REPORTS
1939 to 1956

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
FISH AND WILDLIFE SERVICE

Annual Report 1939-1940

The spillway at Wild Rice refuge dam developed a leak which necessitated much repair work.

At Lake Tewaukon refuge riprap was placed on the two roads crossing the lakes. The riprap was repaired on Lake Tewaukon spillway and the grounds at the government owned cabin were cleaned up.

Thirty five pounds of sage pond weed seed were planted in Lake Tewaukon and in Wild Rice lakes. Three hundred seventy five pounds of prairie bulrush seed was planted on Clouds Lake and Lake Tewaukon and on an artesian pond on Lake Tewaukon refuge. Three hundred pounds of wild millet was planted on the margins of Lake Tewaukon lake. Most of the millet was planted on the recently flooded area known as White Lake. The above labor was accomplished with W.P.A. labor.

QUARTERLY REPORT FROM AUGUST 1, 1939 to OCTOBER 31, 1939

Lake Tewaukon Refuge is excellent and on one visit several hundred Canada Geese were seen there. Water levels are high and many ducks rest on the lake and feed in nearby fields. The cabin at Tewaukon is very good. Some maintenance work should be done around the cabin.

Storm Lake Refuge is very good and contains excellent rearing cover. Clouds Lake Refuge has plenty of water. Wild Rice Refuge is nearly dry. Lake Elsie Refuge also has little water.

All of the easement refuges have a good pheasant population and European Partridge plentiful.

ANNUAL REPORT 1940-1941

All easement refuges are in fine condition. Water levels are far above those of former years and aquatic growths are good.

QUARTERLY REPORT FROM FEBRUARY 1, 1940 to APRIL 30, 1940

Lake Tewaukon Refuge is an excellent area and all water areas are full. Both spillways have been overflowing during most of April. The overflow from Lake Tewaukon passes into Wild Rice Refuge which is entirely full. The spillway at Wild Rice has developed a leak. The repair work at Tewaukon and Wild Rice will be accomplished with W.P.A. labor before July 1.

Lake Elsie Refuge is also nearly full and is a desirable area.

Clouds Lake Refuge lacks about two feet of running over the spillway. It is believed that the spillway on this refuge is too high and that the lake now is as full as it should be as the north shore shows considerable washing from wave action. It is suggested that the spillway should be lowered or a control structure installed.

QUARTERLY REPORT FROM MAY TO JULY 1940

The Sage Pond weed is doing well in Wild Rice but on the west portion of Lake Tewaukon cattle have destroyed much of the marginal aquatic growth. It is suggested that some fencing be done here to remedy the situation. It is also believed that a refuge neighbor at Lake Tewaukon is deliberately pasturing the government owned portion of this refuge. This will be investigated and appropriate action taken.

Clouds Lake has an excellent population of Ruddy ducks with ample aquatic food. The Marsh at Lake Elsie is in excellent condition

with many diving ducks, coots and Grebes rearing their young there.

AUGUST, SEPTEMBER, OCTOBER 1940

Clouds Lake and Lake Tewaukon are excellent and have produced and offered protection to many waterfowl. Clouds Lake and Lake Tewaukon have excellent growths of sago pondweed and this growth had been utilized by thousands of ducks. The diving ducks find this aquatic growth attractive and these refuges serve not only as producers of canvasback, ruddy and redhead ducks but also offer a resting and feeding place for those ducks during migration.

Late in October a pick-up load of sago pondweed tubers were planted in White Lake which is one of the newly flooded water areas of Lake Tewaukon Refuge. The tubers were collected on Clouds Lake where they had washed up in windrows. The tubers were placed in mud balls and sunk in about two feet of water.

The retaining wall at the spillway at Wild Rice Lake dam has been repaired.

Many new signs have been placed on the easement refuges and faded and disfigured signs have been removed and replaced.

NOVEMBER 1, 1940 to JANUARY 31, 1941

Clouds Lake, Lake Tewaukon, Storm Lake and Lake Elsie Refuges had excellent populations of waterfowl until the freeze-up. Clouds Lake and Lake Tewaukon had large populations of redheads, canvasback and other diving ducks. This was no doubt due to the excellent growth of aquatic plants in these two lakes. Lake Tewaukon also served as a resting place and feeding spot for many Canadian Geese.

FEBRUARY, MARCH, APRIL, 1941

Clouds Lake and Lake Tewaukon refuges have more water than during previous years. Aquatic growth is good in both these lakes and each has some rearing cover. These refuges will produce ducks as well as being excellent resting and feeding places during migration. Clouds Lake and Lake Tewaukon usually have good populations of redhead, canvasback and ruddy ducks.

Lake Elsie waterlevel is slightly below that of last year but there is ample water for the south marsh. This area is small but is ideal nesting habitat for ruddy ducks, redheads and coots.

Wild Rice refuge has plenty of water as the spillway has been flowing for over a month. This area has little marsh but is a favorite spot for puddle ducks as there is ideal nesting area near the lake. The repair work done on the spillway the spring of 1940 seems to be in good condition.

Storm Lake refuge has more water than during previous years. The marsh south of the railroad tracks has more water than last year. This area has a fine growth of roundstem bulrush and is good nesting area for diving ducks and coots. Muskrats are very numerous on this area.

MAY JUNE JULY 1941

The cabin at Lake Tewaukon was painted and the yard cleaned up. Grass and weeds near all buildings were cut short to reduce the fire hazard. The weeds were cut on Wild Rice Dam. ~~*Gravel was placed on~~

AUGUST SEPTEMBER OCTOBER 1941

Wildlife on the easement refuges was very satisfactory. Especially is this true of Lake Tewaukon Refuge which during the month of October has almost maximum populations of geese and ducks.

NOVEMBER 1, 1941 to JANUARY 31, 1942

Clouds Lake and Lake Tewaukon are very good refuges. Populations of waterfowl were good during the entire quarter. Both Clouds Lake and Lake Tewaukon have excellent growths of desirable aquatics and are much used by diving ducks. Geese were abundant at Tewaukon during the hunting season and utilized the refuge to good advantage. All old signs at Clouds Lake and Tewaukon Refuges have been replaced with new ones.

Wild Rice Refuge has more water than usual and was utilized to good advantage by waterfowl during the migration season. This refuge has a good aquatic growth, both of submerged and emergent plants. Rearing and nesting cover for waterfowl are very good on this refuge.

Storm Lake Refuge went into the winter with a waterlevel at least 12 inches above that of former years. This refuge has excellent aquatic growths and has a high population of muskrats. Few ducks are raised on this refuge as nesting cover is lacking but the refuge is much used by migrating waterfowl, especially Mallards and pintails. The water was deep enough this year to be used by diving ducks.

Lake Elsie is a good little refuge with water deep enough for diving ducks. Excellent growths of aquatic plants are present and the south marsh is used by marsh-nesting ducks such as canvasbacks, red-heads and ruddies. Most signs at Lake Elsie have been replaced with new ones.

FEBRUARY MARCH APRIL, 1942

All refuges are in good condition. Clouds Lake has about 6 inches more water than last year. Lake Tewaukon and Wild Rice are full. Storm Lake has more water than last year. Lake Elsie refuge has as much water as last year but is not full. All structures on these refuges are in good condition and no repairs are necessary.

MAY JUNE JULY AUGUST, 1942

Lake Tewaukon is the best easement refuge in District #5 both from size and utility. Waterlevels have been quite high during the entire summer and both the bowl and spillway into Wild Rice river has been flowing continuously. On August 31 the main spillway was flowing at least 10 inches deep. This spillway was damaged by high water this spring but temporary repairs were made with sand bags and a permanent repair will be made this fall. Sargent County, the State Department of Game and Fish and the local wildlife association will assist with labor, equipment and funds in this repair.

Lake Tewaukon is a beautiful body of water with excellent rearing cover in the east end of the refuge and at the west end where the Government cabin and the 80 acres of Government-owned land is located.

Tewaukon is a very good fishing lake and produces large northern pike, wall-eyed pike and pan fish. Two resorts are located on the

lake where bait and boats may be secured. I believe a conservative estimate would place the number of fishermen using this lake this summer at 10,000.

Wildlife populations are good, pheasants are numerous and duck production is excellent. The main lake is surrounded by dozens of potholes where duck production is heavy. Most of the potholes produce sago pondweed while the large lake has one of the finest growths of sago and other aquatic plants imaginable.

Clouds Lake is a small refuge lying just west of Lake Tewaukon. Waterlevels have been the highest in the history of the refuge with the spillway flowing for the first time since the refuge was established. Water was flowing over the spillway on August 31. This lake contains only about 50 acres but is fairly deep, produces an excellent crop of sago pondweed and is a favorite for redheads, canvasback and ruddies.

Wild Rice Refuge contains about 640 acres and is an excellent little refuge. There is ample nesting and rearing cover and duck production is high. Water conditions are good. The spillway was flowing about 8 inches deep on August 31. The spillway developed a small leak which was temporarily repaired with bentonite. Permanent repair will be made at the time the Tewaukon spillway is repaired.

Storm Lake is quite small but has very good growth of roundstem bulrush, sago and cattails. This makes excellent rearing cover and there is some good nesting cover. This lake produces many ruddy ducks and coots and in the fall is a favorite resting place for Mallards who often stay until late in the winter.

Waterlevels are at lake capacity. More water could be diverted into this lake but it would serve no useful purpose but only subtract from the available nesting cover.

Lake Elsie Refuge is a small refuge with a very good marsh area south of the lake proper which furnishes good rearing cover. This refuge lacks ample nesting cover. Waterlevels are the best in the history of the refuge.

SEPTEMBER OCTOBER NOVEMBER DECEMBER 1942

Waterlevels at Lake Tewaukon refuge have remained far above normal there being a continuous flow during the entire period over both the bowl and outlet spillways.

During late October the outlet spillway was repaired by extending piling into the retaining wall on the north side of the spillway. The piling was run back of the spillway crest for 20 feet. This piling was then capped with cement and a new concrete abutment built. Although this repair is of a temporary nature it is believed the structure is now safe.

Funds for the repair work were furnished by the North Dakota Department of Game and Fish, by Sargent County and from Sand Lake L.A. 332. Mr Fred Ege was detailed to supervise this job.

Canada geese were not as plentiful on Tewaukon refuge this year as in past years but ducks were very abundant. The fine growth of sago and other good aquatic plants makes Tewaukon a favorite stopping place for diving ducks and canvasbacks, redheads, ruddies, golden eyes, scaup and bufflehead ducks always stop there in large numbers. Early in November the duck population of Tewaukon refuge was estimated to be in excess of 100,000 birds. Mallards made up the largest part of the population but about 20% of the total population were diving ducks.

Clouds Lake like Tewaukon had a surplus of water which spilled down the Rice River and also like Tewaukon aquatic growth was good and this small refuge was much used by diving ducks.

Wild Rice refuge, although small is much used by waterfowl and is developing some excellent growth of sago pondweed.

Permanent repair of the defective ^{spillway} was not accomplished but it is believed the bentonite repair will hold.

Storm Lake waterlevels are excellent and aquatic growth is good. This lake is a favorite nesting place for Mallards.

Like all other lakes in this region, Lake Elsie is filling and it is only a matter of time until the two large marshes north of the lake proper will be filled. These marshes are not a part of the refuge.

ANNUAL REPORT 1941-1942

All easement refuges are in fine condition. Waterlevels have reached an all time high. All potholes are filled and production of waterfowl is much greater than ever before. Some washing occurred at Lake Tewaukon spillway, but this was temporarily repaired pending lower water levels when permanent repairs can be made.

JANUARY FEBRUARY MARCH APRIL, 1943

The repair of the outlet spillway at Lake Tewaukon Refuge accomplished last October under the supervision of Mr. Fred Ege stood up very well, although some of the earth fill east of this spillway washed out. The heavy riprapped gravel on this earth fill prevented a complete washout of the fill and held the lake level about the spillway.

The bowl spillway just west of the county bridge across the west arm of Tewaukon was badly damaged and broken up by frost and ice. Repair of this structure during high water is impossible and the level of this west arm and of White Lake will eventually reach that of Lake Tewaukon proper.

Lake Tewaukon is an excellent refuge and is much used by diving ducks during migrations. The lake proper is surrounded by numerous potholes where there is a good nesting population of puddle ducks.

The repair of the earthen fill east of the outlet spillway can perhaps be accomplished this spring by the use of county equipment.

The Clouds Lake Refuge is relatively deep but contains large sago pondweed beds which make it a favorite with diving ducks. The outlet spillway of the lake has been slightly washed but is not serious or urgent as the waterlevel of the lake is still quite high and exposes the road grade along the southeast shore to wave action.

At Wild Rice Refuge, high water of this spring washed out about 100 feet of the earth fill east of the spillway. This drops the waterlevel of the lake about 3 foot below spillway elevation. Repair of this structure would be a major undertaking and would be impossible with our limited funds and equipment. It would perhaps be advisable to abandon this refuge, at least temporarily.

Storm Lake waterlevels are excellent. The marsh east of the railroad fill is full as well as the lake proper. This lake has an excellent marsh growth of cattails and is a favorite nesting area for ruddy ducks and coot. All structures are in good condition.

Lake Elsie waterlevels are the best since it was made a refuge. Local run-off and overflow water from Lake Elsie has partly filled the large marshes north of the lake proper. These marshes are not a part of the refuge. Ruddy ducks nest in the marsh south of Lake Elsie.

MAY JUNE JULY AUGUST, 1943

Duck production on Lake Tewaukon this season has been the best. Aquatic growth, especially sago pondweed is good.

The waters of middle White Lake are much lower than usual due to the loss of the bowl spillway, but the waterlevel of Tewaukon Lake proper has remained at about 6 inches above the outlet spillway.

The fence around the Government-owned land was repaired. The cabin was given a thorough cleaning. A culvert was placed in the road leading to the cabin and all of the large signs were brought to Sand Lake headquarters for relettering and refinishing.

The earth fill of the dam at this refuge was badly eroded and washed by high water this spring and since its' repair would be a major operation and would require more funds and labor than was available, Mr. F.C. Gillett directed that all signs be removed and not replaced until so directed. The removal of all signs was accomplished.

Lake Elsie has no structures to wash out. Waterlevels are very good, in fact, Lake Elsie proper filled and has been spilling all summer into the large marshes to the north. Aquatic growth is very good and consists of cattails, roundstem bulrush, bladder wort and sago pondweed.

Storm Lake is full to the level of the drainage ditch from which it secures its' water. Aquatic growths are good but deeper water has resulted in some thinning of the heavy growths of cattails and roundstem bulrush. Sago pondweed growth has improved.

This refuge produces some diving ducks but its' main use is to furnish refuge to the large flocks Mallards that feed in the surrounding fields.

SEPTEMBER OCTOBER NOVEMBER DECEMBER, 1943

Several trips have been made to Lake Tewaukon - all of them for the purpose of getting repair work on the dikes started. We are now fairly certain that necessary repair work on the Tewaukon dikes will yet be accomplished this fall. Mr. Walter Moore, an employee of the North Dakota Game and Fish Department was contacted and tentative arrangements have been made for completion of the repair work on the Tewaukon dikes.

A trip was made to the Tewaukon refuge on December 24, and at this time there was no spill over the dam, but water levels were at the very crest.

A trip was made to this refuge for the sole purpose of re-posting the boundary. Several signs must yet be placed, but all signs (old and new type) are in good shape, and there should be no difficulty in recognition of the boundaries. Mr. Laus Hauge, State Deputy Warden is very co-operative, and will give us aid at any time. Water levels at this time were at normal (about the second week in November).

Water levels were normal during the second week of November. There were few ducks using the lake at this time. Muskrat activity was much in evidence, and several permits were issued for removing them in accordance with State Laws

ANNUAL REPORT - 1943

The easement refuges had good waterlevels during the past year and were utilized much by waterfowl not only for nesting but for resting and feeding areas during migrations. Flood water and ice during the

spring run-off caused much damage to the earthen fill on Wild Rice refuge but all the other refuges withstood the floods very well.

JANUARY FEBRUARY MARCH APRIL, - 1944

The easement refuges have held up very well, not considering, of course, Wild Rice and Clouds Lake which will be of no great value until major repairs are undertaken after the war.

The state of North Dakota, and Sargent County completed emergency repairs of the Tewaukon dikes this past winter, and permanent repairs will be undertaken during the coming summer months.

As of April 30, all easement refuges, with the exceptions of those mentioned above were at normal pool elevation of slightly above. Utilization of these refuges, by waterfowl, has not been checked regularly, and it is necessary to rely mainly on reports from nearby residents, and State Wardens. From all reports the refuges do serve as worthwhile additions to the regular refuge system, affording sanctuary to wildlife during the fall hunting season, and also providing feeding and resting grounds during the spring migration. Fishing on several of the refuges is very good, Lake Tewaukon proving to be a very good lake from this standpoint, and one now well-known throughout southern North Dakota as a fine pike lake,

MAY JUNE JULY AUGUST - 1944

Tewaukon - A good crop of young ducks were present in this area on July 8 but mostly in the potholes with a few in the upper end of the lake above the "bowl spillway. On August 12 a flock of about 1500-2000 mallards and pintails were observed near Tewaukon cabin on a mud flat. There also appears to be a good crop of pheasants on the area. Water levels appeared O.K. in July and August and by August 12 only a little water was going over the spillway.

Money was requested to repair dike and local people were promised that it would be fixed during the summer but no money was set up from 53 funds and as yet the work has not been done.

Fishing has been good this summer and fishing pressure very heavy.

Storm Lake- Water conditions were good in July but no waterfowl were noted on the area.

Lake Elsie - This lake is a natural lake with no dam and the part of the lake on the south side of the road was bordered with a good crop of emergent aquatic vegetation. A fair crop of coots and ruddy ducks was observed with a few blue-winged teal.

Clouds Lake - the rock spillway at this area may need some repair at a year or two but was holding up satisfactorily when examined in July and August. A few blue-winged teal were raised on this area.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1944

Tewaukon - In September the exterior of all the buildings were painted with the exception of the boathouse. This job required removing some of the old paint by blow-torch due to the large cracks in the old paint. The large White entrance signs were also replaced as well as several boundary markers.

There were about 2000 ducks at the refuge of which 70% were mallards; 10% pintail and 10% blue-wing teal. Later in the season the population increased somewhat with quite a few diving ducks using the main part of the lake. Coot were very abundant also.

Lake Elsie - Large white entrance signs were replaced at Lake

Elsie in September. At that time there were about 225 ducks ~~and about~~ mostly mallards, pintail and blue-wing teal and a hundred or so coot. This refuge was not visited again during the period.

Clouds Lake had 200 ducks and about 100 coot in September. The area was not checked again during the period. 80% of the ducks were blue-winged teal and mallards, and 10% pintail.

Storm Lake was not visited during the period. Repairs are needed there as recommended by Mr. Gillett in his letter of December 7, 1944 but these will have to wait until the Columbia Dam is repaired. Patrol is not necessary on this refuge due to the excellent cooperation by Mr. Lars. Hauge, State Deputy Warden who lives adjacent to the refuge.

JANUARY FEBRUARY MARCH APRIL - 1945

By far the best of the easement refuges is at Tewaukon and this is probably the only one worth the trouble of maintaining. Clouds Lake could also be included due to its proximity to Lake Tewaukon.

All other easement refuges in District No. 5 are too small to be of great value and are a constant source of trouble due to the following reasons:

1. Lack of adequate patrol.
2. Difficulty of adequate maintenance due to distance.

Even though the refuges were abandoned as a refuge area they would still function as breeding areas due to the dam and dikes. These structures could be kept in repair by the Service or by local interested in conserving water.

MAY JUNE JULY AUGUST - 1945

Tewaukon was visited on June 16 and again on August 1, the latter time in company with Engineers Taylor and Huey. On August 8, 9, and 10 the entire refuge personnel drove to Tewaukon to repair washouts around wingwalls of dam. Also made duck census.

No water was spilling over the dam either on August 1 or August 10. The repair work was completed to the dam by means of wakefield piling but some rip-rap will still have to be placed. The dike is also in need of repair and the engineers have recommended the construction of an emergency spillway.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1945

Tewaukon Refuge was visited during the hunting season but most of the patrol left to the local State Warden and Federal Game Management Agent Jensen. The first trip to Tewaukon was on September 26 and 27. Patrolman Podoll and the refuge manager made the trip. We checked entire boundary and all roads and replaced all missing and damaged signs.

We also took up a load of rock to rip-rap the southwest wing-wall of the dam.

Later on local farmers and Commissioner Loudon were contacted and a plan of work formulated for the construction of an emergency spillway just east and north of the present spillway.

During the hunting season there were several thousand ducks, mostly mallards and pintails on the lake above the bowl spillway but the main lake did not have the usual number of divers. All potholes in and surrounding the refuge were quite heavily populated with ducks however.

The interior of the cabin at Tewaukon was cleaned early in September and floors varnished. Also the basement was dry for the first time in three years and it was cleaned out.

JANUARY FEBRUARY MARCH APRIL - 1946

Lake Tewaukon again produced a good crop of ducks. A small amount of work had to be done on the dam where high water from the spring of 1945 had washed around the spillway and undermined the wingwalls. A new emergency spillway is planned for this area with an elevation one foot above the present spillway.

Local sentiment around Lake Tewaukon is for the Government to buy up this area, put a new dam downstream a few hundred yards and develop the area for wildlife. They are especially desirous of developing the lake for fishing and suggested the State might also help in this. The attitude of the local people in this area is very good and should be fostered at all costs. It is a good chance to put the Service program over in this section of North Dakota.

MAY JUNE JULY AUGUST - 1946

Tewaukon was visited three times during the period, finally to look it over with H. L. Bradley who is to be the new refuge manager.

It is impossible at this time to get labor to work on the proposed emergency spillway but plans have been made with County Commissioner Loudon to borrow County trucks and do this work after the harvest has been completed.

Lake Elsie was visited on August and only one brood of 4 newly hatched blue winged teal was observed. This refuge is not a good breeding area altho the slough just east of the north half of Lake Elsie had a hundred or more ducks in it on August 6.

A new entrance sign is needed on the road entering the east side of the lake.

On August 7, Storm Lake contained about 40 ducks including two broods of blue winged teal. At least 30 of the 40 ducks were blue-winged teal and the remaining 10 mallards. About 10 coot were also observed.

Lake levels at Storm Lake are plenty high, in fact too high for good growth of aquatic vegetation. A bed of hard-stem bulrush in the center of the lake was too sparse as to afford any cover. Apparently due to too much water.

Therefore we cannot see the need for repairing the plug in the drainage ditch so as to force more water into Storm Lake.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1946

Tewaukon - The 40 caterpillar with bulldozer was moved to Tewaukon before the middle of September to start construction of the emergency spillway. Difficult working conditions were encountered in making the cut for the spillway because of wet weather and near water level location of the job site. The spillway, 50' X 50', was completely rip-rapped with one man or larger stone and the surface then covered with gravel. The county dump truck and operator was hired for moving stone and gravel on this job but it was necessary to complete the work with one of the Sand Lake dump trucks owing to the limitation on truck rental. Unseasonably wet weather delayed this work

and the job was not completed until October 18.

Although one or more persons from Sand Lake were on detail at Tewaukon while construction was in progress, the patrol of that area was left to the State Warden and Game Management Agent.

Several thousand ducks and a moderate number of geese made use of the area, with the heaviest concentrations of ducks on the White Lake unit. The main lake, being surrounded almost entirely by an abrupt shoreling, is not so attractive for shoal water species and relatively few divers were noted. Nine Whistling Swan, one pair of adults with 2 young and another pair with 3 young, were noted in the marshy bay on the east side of the main lake on November 13.

Lake Elsie and Storm Lake were visited once during the hunting season. From all appearances hunting pressure in that part of North Dakota was practically non-existent.

Moderate numbers of ducks, Mallards and Pintails only, were noted on all areas. Water levels seemed adequate. Water was just flowing into Storm Lake on November 15 and just a trickle flowing over the dam at Maple River on November 16.

JANUARY FEBRUARY MARCH APRIL - 1947

Water levels remained below spillway elevation during late summer and fall at Lake Tewaukon. There was 14" of water going over the spillway on April 17 and about 2" over the new emergency spill at that time. The run-off was well under way but it did not appear that the water in the lake had been any higher prior to that time.

A new emergency spillway, 50' X 50' was constructed in the dike near the regular spill during the fall. Excavation was made, the area covered with one-man stone, and then covered with gravel. This structure, and all others with the exception of the ox-bow spillway at the highway bridge which was previously damaged, appeared to be in good condition.

A fair number of waterfowl made use of this refuge during the fall but during the only visit this spring the population was very low.

At Clouds Lake water was passing over a low spot in the spillway on April 17 to a depth of about 6" and covering a space 6' wide. This structure was in good condition and the low section is not considered at all serious.

Title to six tracts of land, containing 512 acres and part of which were already included within the boundaries of these refuges, were turned over to the Service just prior to the beginning of the fiscal year. These tracts had formerly been leased from the Indian Agency by local farmers so they were placed under an economic use set up.

A total of 135 acres were grazed producing 150 animal use months with revenue of \$61.80.

A total of 45 acres of hay was harvested which produced 30.45 tons of hay and revenue of \$30.45.

A total of 93 acres was under cultivation but only one unit of 40 acres was under cooperative agreement. On this unit 10 acres of millet was swathed and left in the field for wildlife. A total of \$115.00 revenue was derived from cash rental of the other unit containing 53 acres.

May June July August

~~JANUARY FEBRUARY MARCH APRIL~~ - 1947

An inspection was made of this area on July 18 for the purpose of making brood counts, waterfowl census, and to contact permittees.

Water was just trickling over the dam at Tewaukon and the White Lake unit was about 2' below the crest of the old Bowl spillway. At Clouds Lake the water stood about 6" below the spillway.

It was noted that the dam at Tewaukon was leaking and there was a small stream of water coming out under the rubble masonry on the north end. There was also a smaller leak at the south end but the structure is cracked so badly that water may be escaping through the masonry at that point rather than going around or under it. Only one brood of Gadwall and another of 7 Mallards were noted on the entire area and adult birds were very scarce. Five species comprising about 50 birds were all that were observed. There was also a scarcity of ducks on the potholes in this locality.

Since 6 tracts of land were obtained by the Government we now have some economic use on these areas. One permit was issued for grazing, 3 for hay, and 3 for agricultural lands. Small grains were produced on the crop lands this season and in all cases the refuge share will be left in the fields for wildlife.

Tewaukon was again visited on July 25 in company with Mr. Huey, Regional Engineer, Mr. Lee, Chief Warden, State Game and Fish Department, Mr. Loudon, Chairman, County Commissioners, and several members of the Wildlife Federation from Lidgerwood. All water control structures were inspected and the possibilities of repairs discussed. Considerable pressure is being brought to bear by the state and the Wildlife Federation for repair of the dam and bowl spillway and for installation of fish blocks at most structures.

The state also selected a tentative site for a dam and fish block just outside the refuge on the stream entering the area from the south-east. That project will be a state responsibility and plans were made for construction this season.

An inspection was made of Lake Elsie on July 18 and the water level appeared to be high, being about 1.5' below the causeway road.

No duck broods were noted and only one pair of mallards and a few pied-billed grebes were present. There was a moderate population of ducks on potholes and marshes surrounding this area.

Another visit was made on August 4 in response to a phone call advising that a large amount of rock was being dumped into the lake. It was found that the County was dumping large rock along the north shore at the causeway just to get them out of their way at a nearby gravel pit. Most of the rock has been dumped in shallow water and covered a strip 30 to 50' wide and over 100 yds long. A peninsula had also been started out into the lake. The county holds title to some land along the shoreline but we are not sure as yet as to the boundaries of that tract and have not determined if the rock was dumped on their property or not. At a meeting with Messrs. Wipperman and Bohn, Chairman, County Commissioners, it was agreed that rock could just as well be dumped along the south side of the causeway in the future rather than onto the shallow shoreline of the lake.

Storm Lake refuge was visited on July 18. The water was high and there was just a trickle flowing out of the refuge. The sparse stand of bulrushes over the center portion of the lake do not seem to be increasing in density. A lower water level might assist in the development of these plants and we can see no reason for maintaining the water level at a higher elevation which would occur if additional stone were placed in the stream to force more water into the refuge.

No duck broods were noted and only one pair of adult Gadwall were observed.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1947

The main spillway at Lake Tewaukon has been in only fair condition for several years and there have been small leaks in the structure for some time. An excavation was made at the south end of the structure this period and the lead at that place sealed with clay. Riprap was removed at the other end and the leak sealed with concrete at that location. This is another rubble masonry structure which is difficult to maintain.

The posting along the refuge boundaries was completely checked prior to the hunting season and signs replaced and added where necessary. At this same time all broken glass was replaced in the basement windows at the cabin.

Only moderate numbers of ducks were noted at any time and our estimate for geese and total numbers for ducks are based on reports from local residents.

Two grazing permits, covering a total of 100 acres, were issued this year and all operations were completed during this period. The use of Unit G-2 was considerably reduced and the forage should show some improvement during the coming year. Grazing on Unit G-1 has never approached the carrying capacity and that area is in good condition.

Three hay permits, covering 90 acres were also issued. A lighter demand for hay resulted in only 50 acres being utilized this year.

A total of 125 acres was under cultivation this year. This consisted of 4 units covered by 3 permits. Since we control only a very limited acreage on these easements, the entire refuge share of crops were left in the fields for wildlife.

34½ acres of wheat, oats and millet, equivalent to 567 bushels had it been harvested, was left in the field.

Fishing was reported as only fair during the summer and early fall. We now understand, from newspaper reports, that Lake Tewaukon has been selected as one of the few lakes in North Dakota where ice fishing will be permitted during January and February.

The only visit to Storm Lake was on Oct. 1, when posting along the entire boundary was checked. All damaged signs were replaced and others added where necessary. Water levels were normal for that time of the year. Waterfowl were very scarce and not present in sufficient numbers for reporting.

Lake Elsie was visited on September 26 when posting along the entire boundary was checked. All damaged signs were replaced and additions made where necessary. Water levels were normal at that time. Waterfowl were very scarce and not present in sufficient numbers for reporting.

JANUARY FEBRUARY MARCH APRIL - 1948

Lake Tewaukon and Clouds Lake were inspected on March 29 and again on April 17. Although much of the snow had melted by March 29 there had been very little run-off as the moisture soaked into the ground. At that time ice completely covered all water areas except two small water holes in the White Lake Unit. There was only a very small flow of water from White Lake into Tewaukon and a moderate flow into Tewaukon from the stream to the southeast. The water level at Tewaukon was from 1 to $1\frac{1}{2}$ feet below spillway. The level at Clouds Lake was at least a foot below the spill.

It was noted that a fish screen had been installed under the road bridge just below the old oxbow spillway.

By April 17 the flow from the stream coming in from the southeast had stopped. The water coming into Tewaukon from White Lake was just about the same as on March 29. However, Tewaukon had filled up with just a bare trickle over the spillway. There were no signs that the overflow had been any greater previous to that time.

An unusually large number of Whistling Swans were noted during the first inspection but the populations of other waterfowl with the exception of Scaups and Coot seemed to be lower than usual.

There was a heavy winter kill of fish at Tewaukon with some loss in the White Lake Unit. Fortunately, most of the loss was suckers and carp but there were also many bullheads. The most serious loss from the fishermen's viewpoint, was the walleyed pike of which there was a considerable number in sizes up to 5 pounds. Some perch, crappie, and northern pike were also noted but the total number was small at that time.

Lake Elsie was inspected on January 9 in connection with the winter waterfowl inventory. At that time the entire lake was frozen and no birds were in evidence.

MAY JUNE JULY AUGUST - 1948

The water level at Lake Tewaukon was about 6 inches below the spillway, with no flow from the White Lake Unit into the lake, and about one foot below the spillway at Clouds Lake. Last year on July 18, about the same date, the water stood at the top of the spillway at Tewaukon and was only 6 inches low at Clouds Lake. Water control structures seemed to be in fair condition although there is still a slight seep thru the rubble masonry spillat Tewaukon

Waterfowl numbers have increased very favorably on these areas with the production of young nearly five times that of last year and over four times as many birds using the refuges. Blue-wing Teal far outnumbered all other kinds while there was a three way tie of Mallard, Gadwall, and Pintail for second position.

There was also a relatively large number of the divers present but no young of those species observed.

All six tracts of Government-owned land are under permit for economic use. Two permits have been issued for grazing, three for hay, and three for crop lands. Small grains were produced on all cultivated lands and in all cases the refuge share will be left in the field for wildlife.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1948

The water level at Clouds Lake was about two feet below the spill-

way with the lake entirely frozen except for a few small holes. Only 17 Mallards and 3 Pintail were noted on the area.

The level at Lake Tewaukon stood about one foot below the spillway which is normal for this season. Mud flats were exposed in the White Lake unit and all water areas frozen on November 20 except several waterholes maintained by ducks.

There has been a decided increase in the number of waterfowl this fall from all reports and our limited observations. At least 10,000 Mallards, 140 Lesser Canada Geese, 100 Lesser Scaup, and 6 Bufflehead were noted on the day of inspection. Considerable corn and millet is grown in this territory and the supply of waste grain from this source is almost unlimited until covered by deep snow. Hunting was reported as good but several persons advised that the waterfowl were very reluctant to leave the refuge during the hunting season.

On November 20 it was noted that a wooden road bridge was under construction across the Wild Rice River about one-fourth mile below our spillway at Tewaukon. This is to serve the new county road which is to be built around the north shore of the lake. The proposed road will cross two or three tracts of refuge land but no request for right-of-way has reached this office yet. One or more new County Commissioners were to take office January 1 so action probably will be started in the near future.

Two grazing permits, covering a total of 130 acres, were issued this year and all operations have been completed. The amount of forage was not up to normal because of dry weather so useage was kept below capacity on unit G-2. The use of the other unit has always been very light.

Three hay permits, Covering 90 acres, were also issued. There was a greater demand for hay but only 60 acres was utilized. In one case the grass was so short that it was not economical to cut it at and at other locations on high ground there was so little hay that it was difficult to pick up with a rake. This same situation was quite general all over the country. A total of 167 acres was under cultivation, 68 acres of this was summer fallow and 99 acres in crops. One field of 22 acres of wheat was a failure and no crop was harvested. Practically all crop lands are infested with quack grass so a rotation including summer fallow or row crops should be followed. One plot of old farm land, containing about 60 acres, was broken up for the first time this year. This formerly supported an almost complete stand of quack so it was summer fallowed. The entire refuge share of all crops were left in the fields for wild-life since we control a limited acreage on these easements. A total of 32.7 acres of wheat and millet equivalent to about 453 bushels, had it been harvested was left in the field.

From all reports fishing was rather poor during the year and very little activity was noted. There was a heavy loss during the winter of 1947-1948.

ANNUAL REPORT FISCAL YEAR 1949

Water levels, regarded as normal, ranged from spillway level in early summer to one foot below spillway in winter. About 380 ducks were produced on the area. During summer some 1400 ducks used the refuge. A thousand geese and 33,000 ducks were present during the

fall.

One hundred and thirty acres were grazed under permit; income was \$51.20. Sixty acres of wild hay were cut; income was \$60.43. Seventy-six acres of Wheat, 17 acres of Barley and 6 acres of millet were grown under permit. The Government share - 26 acres of wheat and 6 acres of millet were left in the field.

A roadway is under construction along Lake Tewaukon. Final agreement has not been reached regarding a right-of-way across three tracts of refuge land.

MAY JUNE JULY AUGUST - 1950

Tewaukon and Clouds Lake visited 4 times during the summer. Over 100 cars of fishermen-picnickers were counted on each of 2 Sundays. Many more were reported for holidays.

Water 2 inches over spillway during early May and 1 inch over until Mid June. Water level 2 inches below spillway as of mid August.

Four minor leaks in the rubble masonry at the spillway were repaired on August 17.

Brood counts made July 23 and August 20. On one bay above the bowl spillway 31 broods were counted along $1\frac{1}{4}$ mile of shoreline. This part of the refuge is an excellent waterfowl nesting area. The brood count indicated Tewaukon is a more valuable waterfowl nesting area than previously thought. The brood index indicated a total of at about 150 broods for this area which would mean a total production of about 750 young ducks. The breeding population (including young) is about 1000. Pintail ranked first with Blue-winged Teal and Mallard tied for second place and Baldpate, Ruddy and Gadwall next in order.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1950

The boundary of the entire area of Tewaukon and Clouds Lake was covered on October 4. All damaged and missing boundary signs were replaced. The Lake Tewaukon dam and spillway were in good condition. Repairs made last period on the spillway and control gate stopped all leaks in the rubble masonry.

Waterfowl noted were: Clouds Lake - 1500 Mallards, 100 Pintail; White Lake - 140 Mallard, 25 Blue-winged Teal; Lake Tewaukon - 260 Ruddy duck, 400 Shoveller, 11 Redhead, 15 Mallard, 20 Gadwall and 10 coot.

The area was patrolled during the weekend of October 21-22. About 45 hunters were observed in the area. Waterfowl were plentiful but there was little movement outside the refuge boundary. Observations included approximately 9,000 Mallards, 1500 Blue and Snow Geese, 50 Canada Geese, 200 Ruddy Duck, 500 Pintails 200 Lesser Scaup and a few Redhead, Gadwall and Blue-winged Teal. Four white-tailed deer and about 40 pheasants were observed in the vicinity of the cabin.

A general reconnaissance of the Tewaukon area was made on December 13. The refuge hay crop was measured. Marsh and lake were frozen completely and no waterfowl were observed.

JANUARY FEBRUARY MARCH APRIL - 1951

Tewaukon and Clouds Lake Easement Refuges were visited on April 26. All areas were free of ice with water levels about normal for April. The Tewaukon spillway appeared to be in good condition with about .8 ft. of water going over the structure.

There was evidence of a winter kill of fish with Carp, suckers and Walleyed Pike the most common species found dead along the shore and outlet. Local residents were rather alarmed about this situation.

Storm Lake easement refuge was visited April 26. Boundary and recognition signs were checked. Water levels were about normal for April and there appeared to be a good growth of emergent vegetation. Diving ducks use the area extensively during migration periods, and Ruddy Ducks and Lesser Scaup nest in the area. Approximately 400 Lesser Scaup and 10 Ruddy Ducks were observed.

One Common Loon was observed on the area. This was the only loon seen during the entire migration period at Sand Lake Refuge and through the North Dakota Easement area.

There were several signs of fresh beaver cutting's indicating that a colony has been established on the area recently.

Lake Elsie Easement Refuge was visited on April 26/ Water levels were below normal and there was only a slight flow between the two portions of the lake. There was a heavy winter kill of fish in the area. Species observed were Walleyed Pike, Northern Pike, Blue gills, crappie, Sucker and Carp. The area has provided good fishing throughout the summer so residents are deeply concerned over the apparent heavy winter kill. The area is quite small, however it is not believed the kill was too serious as the most fish remain quite small indicating perhaps a lack of food or over population by some species.

Local residents reported the area was used by many "dark geese" the past spring. No doubt they meant Canada Geese as 39 Common Canada's were seen on the refuge. Approximately 200 Lesser Scaup and 6 Mallards and Pintail broods are recorded during 1950 brood counts so these species apparently move into the area as temporary potholes dry up.

MAY JUNE JULY AUGUST - 1951

Tewaukon and Clouds Lake Easement Refuges were visited several times throughout the period. Brood counts made on July 26 and Aug. 6 revealed 43 broods present (10 Gadwall, 16 Mallard, 11 Blue-winged Teal, 2 Baldpate, 1 Shoveller, 1 Pintail, 1 Redhead, 1 Canvasback, totaling 308 young for approximately 5 miles of shoreling observed. This gave an average of 8.6 broods per mile which was the second highest brood density recorded this year. Nesting habitat includes a large percentage of upland which is grazed extensively or consists of prairie type grassland cut annually for hay.

Special use permits in effect on the area include 3 share crop covering 180 acres, 2 haying and 1 grazing. The refuge share of crop left in the field for wildlife included 19 acres wheat, 10 acres oats and 27 acres of corn.

Banding operation on the Tewaukon area on August 6 resulted in the capture and banding of 93 ducks.

It has been proposed that the Tewaukon cabin, garage and boathouse be moved to Sand Lake Refuge. The cabin is rarely used by refuge personnel at the present site and would provide a badly needed addition

to the clerks quarters. The garage and boathouse would be useful for additional garage space at headquarters and site 2.

Of special interest was the observation of 2 broods of pinnated grouse and 1 brood of Hungarian partridge on the Tewaukon area July 26.

Storm Lake Easement Refuge was visited on July 28. Brood counts indicated 18 duck broods present (7 mallard, 4 blue-winged teal, 2 gadwall, 2 pintail, 2 canvasback, 1 unidentified, totaling 149 young). Approximately 80 coot were seen, several with broods, but difficult to count. There is good growth of hardstem bulrush throughout much of the area with some submerged aquatics chiefly sago pondweed. The adjoining upland is primarily pasture, moderately grazed with some hayland on the east side. Total shoreline observed was about 2 miles, with 18 broods counted giving an average of 9.0 broods per mile. This was the highest brood density recorded for all areas.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1951

Tewaukon and Clouds Lake refuges were visited on October 3 to check waterfowl populations and replace damaged boundary signs. The following waterfowl were observed: Mallard - 300, Blue-winged Teal - 400, Redhead - 100, Gadwall - 50, Baldpate - 500, Coot - 500, White-fronted Geese - 15, Common Canada Geese - 35, Snow Geese 2.

North Dakota Wardens reported several thousand ducks and small flocks of snow and blue geese using the area during mid October. Accurate census data are not available at this time.

The 1951 hay crop was measured on November 16. Water areas were frozen over except for a small portion of Lake Tewaukon. No waterfowl were observed.

JANUARY FEBRUARY MARCH APRIL - 1952

The Tewaukon Refuge was visited on April 10th through use of the Service aircraft. Spring run-off cut through many roads in the area and others were breaking up so that travel was reported to have been limited to farm tractors for a two week period.

The ice was just breaking up on Lake Tewaukon on April 10. There was a flow over the emergency spillway and the main spillway was running at full capacity. The "bowl" spillway was nearly under water. White Lake was entirely free of ice and harbored the bulk of the waterfowl observed on the area as follows: Pintail - 1800, Mallard - 1200, Whistling Swan - 80.

There was a winter kill on fish as large numbers of dead fish were seen along the shore of Lake Tewaukon. Most of these appeared to be carp.

MAY JUNE JULY AUGUST & 1952

Tewaukon and Clouds Lake were visited regularly all summer in the course of moving the buildings from there to Sand Lake and in connection with economic use.

Water levels were approximately normal most of the period. However the heavy run-off early this spring left a few scars here and there.

Waterfowl production was far below that of last year when 8.6 broods per mile were found on 5 miles of shoreline. This year 13 broods were observed on 4 miles of shoreline for an average of 3.2 broods per mile. A total of 150 coots and between 900 and 1,000 mallards and pintails

were observed on August 5, 1952.

Special use permits in force on Tewaukon include 3 share-crop covering 180 acres, 2 haying and 1 grazing. The refuge share of the crop left in the field included: millet 40 acres, corn 13, oats 11 and barley 10 acres.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1952

Tewaukon Refuge was visited on October 10 to check boundary signs and repair a hole in the spillway of the Tewaukon dam. The following waterfowl were observed on that day: Mallards 5,300, Pintails 150, Green-winged Teal and Ruddy ducks 100. Fifty snow and blue geese were also observed.

The 1952 hay crop was measured on November 5. On that day there were an estimated 17,800 ducks in the area, made up of mostly mallards with some canvasbacks, green-winged teal, and American Mergansers. Nineteen swans were also observed.

JANUARY FEBRUARY MARCH APRIL - 1953

Tewaukon Refuge was visited May 2, 6 and 9. Particular attention was given to the repairs made to the outlet dam in Lake Tewaukon which had been accomplished last fall. There were found to be O.K. but approximately 4 inches settling was observed in the rip-rap apron on the up stream side. Tapping revealed some hollow spots that, as yet, haven't washed out.

Water in the lake was estimated to be eight inches below spillway on May 2; there is no gage.

Good use was made of food left in the fields, particularly by geese. About 12,000 geese of all species (blues, snows and Canadas) were reported on the refuge in April by residents of the area.

The usual small breeding population of ducks is present minus the large numbers of pintails that stopped last year when there were numerous shallow puddles as a result of run-off. Of particular interest was an observation made May 6 on Clouds Lake; three species of grebes were found together along the east shore - pied-billed, horned and eared! There were three pairs.

Ten male pheasants were observed on territory May 6 from Olaf Lee's farm to the outlet dam.

Storm Lake was visited May 7. This is a much more productive area than Lake Elsie, i.e. from the standpoint of waterfowl. However, it is situated virtually in "the lap" of the town of Milnor. It was very depressing to note that the city dump - (on the refuge, of course) ground afforded the only good nesting cover for pheasants. Here a trash fire was burning that had escaped and threatened to burn out the adjoining marsh. The fire was brought under control by backfiring along the road.

Fifty blue-wings were seen, most of which were paired but not on territory. There was a scattering of scaup and two pairs of canvasbacks. In previous years brood counts on Storm Lake have indicated good production. Water levels on May 7 appeared about normal.

Lake Elsie was visited May 6 and we were informed by locals that the lake was to be re-opened for fishing May 16. It was closed last year. Very few birds were present on the lake which seemed to be slightly below average May water levels. The gravel-washing plant was in operation on the west side and there is every indication that this area

received extremely heavy public use - especially for boating, swimming and fishing. The recognition sign needs painting.

MAY JUNE JULY AUGUST - 1953

This refuge (Tewaukon) was visited several times during the period in the course of routine administration. In addition, because of the newly awakened interest by local sportsmen in that area resulting in the organization of the Lake Region Improvement Club, several club meetings were attended by the refuge manager.

Representatives from the Regional Office were also present at these meetings, and the possibilities for refuge development for fish and waterfowl were thoroughly discussed. The state also sent a representative down to discuss the Tewaukon fishery prospect.

The outcome of these meetings was that funds were made available to replace the old bowl spillway inlet structure on Lake Tewaukon; and a fishery survey of Lake Tewaukon and adjoining White Lake and Clouds Lake was made.

The results of the fishery survey have been reported separately. While not too encouraging because of relatively shallow water and an abundance of rough fish, there is a good possibility that fishing can be improved.

The greatest need at the present time is to rebuild the inlet structure so that the White Lake Marsh may be rehabilitated for waterfowl. Also, control of water levels in White Lake is essential if the area is to be used for a spawning ground by northern pike and walleyes.

Water levels have been high at Tewaukon all summer long. Based on shoreline brood counts, waterfowl production is slightly below normal but above that of last year. A total of 8 broods were observed on $1\frac{1}{2}$ miles of shoreline for an average of 5.3 broods per mile of shoreline transect. This compares to 8.6 broods per mile in 1951 and 3.2 broods per mile in 1952. Broods seen were: 5 mallards, 2 pintail and 1 gadwall.

In spite of an open season in 1952, a herd of 12 white-tails were staying in our tree plantation around the old cabin site. Deer habitat at Tewaukon is even more restricted than at Sand Lake and this situation should be closely watched.

Special use permits in force at Tewaukon are 3 share crop (180 acres), 2 haying and 1 grazing. Our share of the crop which was left in the field was: 33 acres millet, 3 acres corn, 10 acres wheat, and 20 acres of oats. The Soil conservation Service is making a capability survey of refuge lands at Tewaukon and will make this available for our use in the near future.

A brood count was made at Storm Lake on August 4. The following is a summary of broods seen: Pintail, 5 III; Pintail 5 III; Gadwall 4 II; Gadwall 3 III; Gadwall 10 I; Gadwall 7 II; Gadwall 7 II; Unidentified 6 III.

Thus, 8 broods were seen along 1.5 miles of shoreline. There were also 25 black terns, about 100 Franklin's gulls, at least 20 ruddy ducks males, and 100 mallards, gadwalls and bluewinged teal as well as a few coots using the refuge. One moulting lesser scaup was noted. Most of the waterfowl were concentrated in the half of the lake east of the railroad grade.

Sago pondweed appeared quite abundant in many parts of the east one-half of the lake. Roundstem bull rush growing in the lake west of the railroad grade looked decidedly unhealthy. Much of it was pale and yellowed and the stand was very sparse.

Lake Elsie was visited on August 5 to make a brood survey. No broods were seen. Ten pied-billed grebes, 6 coot, 6 mallards, and 1 moulting lesser scaup were seen in the south end of the area.

Wild Rice refuge was visited by Forrest Carpenter and Manager Dill during mid-May. It was recommended that the area be abandoned because the expense of replacing the structure at the north end could not be justified on the basis of the area's value to waterfowl.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1953

Tewaukon Refuge was visited on September 29 and 30, and all boundary signs were replaced, and a few new sign locations added to insure adequate posting.

At that time, there were 500 ducks using the area, mallards, pintails, baldpates and blue-winged teals. There were also about 100 coot present.

Upon visiting the old cabin site, three deer were seen, as well as an abundant pheasant population. One young pheasant no more than two weeks old was seen at the bridge on the road to the cabin site.

Water levels were at about the same level as the preceding year.

On November 15, a peak of 50,000 mallards and 1,111 geese were seen at Tewaukon by GMA Jensen and Brevig, as well as 35 swans.

The local sportsmen's group baled 400 bales of refuge millet, which was stacked at the cabin site for wintering pheasants.

On November 18, there were 27,600 mallards concentrated almost entirely in the bay in White Lake near the bowl spillway, snow-blues, about 300, and 200 Canadas, mostly Richardson's geese were seen in White Lake proper, as well as 88 whistling swans.

A fish removal program was initiated in Lake Tewaukon to remove an over supply of bullheads, suckers, buffalo and carp. The operation is under the direction of the North Dakota Game and Fish Department and Mr. Burton Plant, of Rosholt, S. Dak., was awarded the contract.

Bullheads and suckers were taken in hoops while carp and buffalo are being taken in seines. As of December 31, 2,000 pounds of bullheads 1,500 pounds of suckers, 2,000 pounds of buffalo, and 25,000 pounds of carp have been removed. The State of North Dakota receives 31 percent of the proceeds as its share.

The carp and buffalo average between three and four pounds, the suckers are very small, and bullheads estimated at slightly under a half-pound. One five pound walleye was taken in the seine, as well as 40 northern pike weighing from 1 to 12 pounds. Three yellow perch that were weighed, averaged slightly over 1 pound 3 ounces, and one of these weighed a pound and 6 ounces.

A game fish stocking program is planned as soon as the bowl spillway is rebuilt, and the area will be an attractive recreation spot within a very short time.

One apparently active beaver lodge was noted in Skrock's Bay along the south shore.

Lake Elsie was visited on November 15, and at that time 1,000 ducks were using the area - 500 lesser scaup and 500 mallards.

JANUARY FEBRUARY MARCH APRIL - 1954

Tewaukon Refuge: During April, the Wild Rice River merely ran

a trickle, and water levels were at about normal for the period following spring runoff. The water in Lake Tewaukon was 6" below spill-way level near the end of April.

Common Canadas appeared there on February 8, and by March 28, 600 were using the area. This was probably the peak for this species.

According to local people, the largest number of snow-blues ever to use the area in the springtime moved into and through April 8. The folks say that a steady stream of geese poured in for about 3 hours on that date. No estimates of the size of the flight was obtainable.

When the refuge was visited on April 15, 15 whistling swans were found in White Lake, as well as 100 canvasbacks and 50 lesser scaup. Mallards and pintails were also present. Common mergansers were seen in Lake Tewaukon.

The commercial fishing operation was continued until during the last week in February, when ice weakened by mild weather forced the fishermen to give up the work.

The following is a summary of the commercial catch from the three lakes at Tewaukon Refuge, taken with a 1700 foot seine and hoop nets:

Lake Tewaukon

Carp	98,526 lbs.
Buffalo	22,185
Sucker	9,989
Bullhead	8,096
perch	1,248
Northern Pike	138 fish, Av. Wt. 7.1 lbs.
Walleye	3 fish, Av. Wt. 4.6 lbs.

White Lake

Carp	1,750 lbs
Perch	a few

Clouds Lake

Carp	7,100
Sucker	2 64
Bullhead	1,100
Perch	93
Walleye	3 About 5 lbs each.

Northerns and walleyes caught in the seine were returned to the lake whence they came. Local sales of perch were permitted, but none could be shipped out.

No winter kill occurred, and oxygen content was found to be very high. Samples were taken on January 13-14 and on March 10-11 by Bob Sharp, Fishery Management Biologist. /The following summarizes the result he obtained:

January 13-14

Station* 1

15.1 p.p.m.

Station 2	13.5 p.p.m.
Station 3	13.9 p.p.m.
Station 4	14.5 p.p.m.

March 10-11

Station 1	43.4 p.p.m.
Station 2	25.0 p.p.m.
Station 3	37.6 p.p.m.

The extremely high March 10 readings, far above saturation, were explained by Mr. Sharp as probably resulting from a high diatom and algae population that continued to add oxygen to the water throughout the winter because there was no snow covering the ice.

Storm Lake was visited on April 19. A large population of lesser scaups, redheads, and cans were using the area as well as some mallard, pintails, gadwalls, and a few of the other dabblers. Coot were also common there at that time.

Potholes in the Easement District #5 were very low. Casual observations while passing through the area indicated that 80 percent of the sloughs contained no water. However, subsoil moisture conditions were generally better than at Sand Lake because there was more snow in that area.

MAY JUNE JULY AUGUST - 1954

When visited of May 7 Tewaukon was still supporting 300 snow-blues. A movement of shovelers and blue-winged Teals was the only other item noted there worth of mention. Brood counts taken there on August 6 turned up 13 broods in Clouds Lake, despite the bare shoreline. Three other broods were seen along 3 miles of shoreline of Lake Tewaukon.

Storm Lake was also visited on Aug. 6, and two large wood refuge signs were placed, and boundary signs that had been disfigured were replaced. One gadwall brood of 8 class I young was seen, as well as a few pintails and ruddies. Beaver had been working along the south shore of the lake.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1954

At Tewaukon Refuge on September 24, 6 white-fronted geese had arrived from the north. As the migration continued, the goose population continued to grow until the total peak of approximately 2000 was reached about the third week in October. This figure includes snow-blues and Big Canada geese.

The most ducks, 4500 mallards, were observed by Rod Brevig, GMA, on November 14. No doubt more ducks than these used the area, but a count was not made at the time of the big movement through there.

All boundary signs that had been damaged were replaced, and some new signs were added to make clearly the boundary area.

Water levels in White Lake and Clouds Lake were quite low, although the water level in Lake Tewaukon itself was about 6" below the spillway, about normal for this time of the year.

JANUARY FEBRUARY MARCH APRIL - 1955

Water levels at Tewaukon and Clouds Lake were eight inches to one foot below normal in April. With recent rains, they have improved but are still low.

Waterfowl use, especially by geese, was excellent from April through mid-May. An average of 20,000 blues and snows was present most of this time with a liberal sprinkling of Canadas. The marked decline in duck-use noted at Sand Lake was also noted at Tewaukon.

Winter fishing was good (yellow perch and northern pike). As many as 90 cars were counted on Lake Tewaukon at one time. The perch ran up to 2 pounds and the northernns up to 12 pounds. The catch was mainly perch with an occasional northern being taken.

Of particular interest is the fact that the land acquisition program for Tewaukon is approaching the stage where this area's excellent potential for waterfowl can soon be realized.

MAY JUNE JULY AUGUST - 1955

Numerous visits have been made to Tewaukon Refuge during the period. Land acquisition and the building of the new contract control structure, to replace the old White Lake bowl structure, has put Tewaukon on the map as a promising management area.

At the end of the period the structure is about complete except for finish work on the concrete and placing rip-rap on the dike. This will be a great improvement in water management for the area.

Three serious wind and hail storms the early part of July wiped out the southern half of Sargent County including refuge crops and ducks. Hail stones 4 inches in diameter were reported on two separate days with as much as 11 inches of rain in a week. Needless to say crops other than late millet and some flax were destroyed 100%. The refuge crops were so badly washed and inundated that the grain was left shelled out on the ground for early migrants. The local economic situation is at a very low level considering the bad rust infestations experienced the past two seasons.

Only two broods were reported on the area by local residents. A brief survey was made by refuge personnel on two different occasions in early August. Nothing appeared but a few scatter groups of non-nesters.

SEPTEMBER OCTOBER NOVEMBER DECEMBER - 1955

Water levels at Tewaukon Refuge were not as low as in other parts of the country, for the cloudburst back in July that, with hail, resulted in 100% crop losses, brought lake levels up to near normal. Lake TEwaukon was about a foot below spillway in October.

Waterfowl use of the refuge was about average for ducks, but fewer geese stayed. This was because green browse was brash and dry due to the almost complete lack of rain during the fall months.

Of most importance to this refuge was the completion of the structure for the White Lake unit which will permit re-activating this fine marsh. Plans call for staffing Tewaukon shortly after January 1, 1956, and there are myriad opportunities for developing this excellent area. This means that Tewaukon will lose its "orphan" status which it

necessarily has enjoyed while under the administration of Sand Lake, and will embark on its own as a full fledged refuge.

Frequent trips were made to Tewaukon by Sand Lake personnel to assist the Branch of Engineering with construction - mainly running levels and other surveying work. Much of this was done from a boat which was hauled up from Sand Lake as needed.

Another major item was checking the boundary posting and replacing shot up signs. Two man days were spent on this work.

Lake Elsie was visited once in September and two man days were spent in replacing shot-up and missing boundary markers.

Storm Lake was visited once in September and all boundary markers checked and replaced where needed.